What is claimed is:

1. A sample analyzer comprising:

a liquid aspirator for aspirating a sample from a closed container;

a preparing section for preparing an analysis sample using the aspirated sample; and

an analyzing section for analyzing the prepared analysis sample;

the liquid aspirator including an elongated pipe to be stuck into the closed container, the pipe having a liquid flow path extending therein and a plurality of communicating sections provided in an outer surface thereof, at least one of the communicating sections communicating between an inside and an outside of the container when the pipe is stuck into the container.

2. The sample analyzer of claim 1, wherein the liquid flow path extends parallel to an axis of the pipe.

3. The sample analyzer of claim 1, wherein each communicating section includes an elongated recess provided in the outer surface of the pipe.

4. The sample analyzer of claim 3, wherein each recess are provided parallel to an axis of the pipe.

5. The sample analyzer of claim 4, wherein the recesses are arranged in line.

6. The sample analyzer of claim 5, wherein an interval between the recesses is smaller than each recess in length.

7. The sample analyzer of claim 3, wherein the closed container has a cap through which the pipe is stuck into the closed container, the cap having a thickness smaller than a length of each recess.

8. The sample analyzer of claim 1, wherein the pipe has a head section tapered toward a tip thereof, and the tip is positioned on an axis of the pipe.

9. The sample analyzer of claim 8, wherein the head section is a pyramid in shape.

10. The sample analyzer of claim 9, wherein the head section is a trigonal pyramid in shape.

11. The sample analyzer of claim 9, wherein the plurality of communicating sections include elongated recesses provided in line parallel to an axis of the pipe, and the recesses are

arranged in a straight line extending from one ridgeline of the head section.

12. A liquid aspirator for aspirating liquid from a closed container, comprising: an elongated pipe having a liquid flow path extending therein and a plurality of communicating sections; wherein the communicating sections are provided in an outer surface of the pipe for communicating between an inside and an outside of the container when the pipe is stuck into the container.

13. The liquid aspirator of claim 12, wherein the liquid flow path extends parallel to an axis of the pipe.

14. The liquid aspirator of claim 12, wherein each communicating section includes an elongated recess provided in the outer surface of the pipe.

15. The liquid aspirator of claim 14, wherein the recesses are provided parallel to an axis of the pipe.

16. The liquid aspirator of claim 15, wherein the recesses are arranged in line.

17. The liquid aspirator of claim 16, wherein an interval

between the recesses is smaller than each recess in length.

18. The liquid aspirator of claim 14, wherein the closed container has a cap through which the pipe is stuck into the closed container, the cap having a thickness smaller than a length of each recess.

19. The liquid aspirator of claim 12, wherein the pipe has a head section tapered toward a tip thereof, and the tip is positioned on an axis of the pipe.

20. The liquid aspirator of claim 19, wherein the head section is a pyramid in shape.

21. The liquid aspirator of claim 20, wherein the head section is a trigonal pyramid in shape.

22. The liquid aspirator of claim 20, wherein the plurality of communicating sections include elongated recesses provided in line parallel to an axis of the pipe, and the recesses are arranged in a straight line extending from one ridgeline of the head section.

23. A liquid aspirator for aspirating liquid from a closed container, comprising: an elongated pipe having a liquid flow

path extending therein and a head section tapered toward a tip thereof; wherein the tip is positioned on an axis of the pipe.

24. The liquid aspirator of claim 23, wherein the head section is a pyramid in shape.

25. The liquid aspirator of claim 24, wherein the head section is a trigonal pyramid in shape.

26. The liquid aspirator of claim 24, wherein the pipe includes a first elongated recess provided in an outer surface thereof, and the first recess is arranged in a straight line parallel to an axis thereof and extending from one ridgeline of the head section.

27. The liquid aspirator of claim 26, wherein the pipe further includes a second elongated recess provided in an outer surface thereof, and the second recess is arranged in the straight line.

28. The liquid aspirator of claim 23, wherein the liquid flow path has a suction port passing through a side wall of the pipe.

29. A sample analyzer comprising the liquid aspirator of

claim 23.

30. A sample analyzer comprising;

a preparing section for preparing an analysis sample using a sample;

an analyzing section for analyzing the prepared analysis sample;

first and second flow paths for transporting liquid to the preparing section;

first and second valves for opening and closing the first and second flow paths, respectively;

first and second air bubble sensors for sensing an air bubble in the first and second flow paths, respectively, each air bubble sensor outputting a signal; and

a controller for controlling the first and second valves so that the valves are selectively opened,

wherein the controller judges whether the air bubble is present in the flow path opened by the valve based on the signals outputted from the first and second air bubble sensors.

31. The sample analyzer of claim 30, wherein the controller judges that the air bubble is present in the flow path when the corresponding air bubble sensor keeps outputting the signal indicative of the sensed air bubble during more than a predetermined time period.

32. The sample analyzer of claim 30, further comprising a display, wherein the first flow path is connected to a liquid container containing the liquid and the controller allows the display to display that the liquid container is empty when the controller determines that the air bubble is present in the first flow path.

33. The sample analyzer of claim 30, further comprising an OR gate for transmitting a logic sum of the signals outputted from the first and second air bubble sensors to the controller.

34. The sample analyzer of claim 30, further comprising a switching section for selecting the signals outputted from the first and second air bubble sensors referring to the opened valve to transmit the selected signal to the controller.

35. The sample analyzer of claim 30, wherein the first and second flow paths transport a diluent and a hemolyzing agent as the liquid, respectively.

36. An air bubble detector comprising:

first and second air bubble sensors for sensing an air bubble in first and second flow paths, respectively, each air

bubble sensor outputting a logical pulse signal, the logical pulse signal representing a sensing time period of the air bubble in pulse width; and

an integrating section for integrating pulse widths of the logical pulse signal outputted from each sensor during a time period.

37. The air bubble detector of claim 36, further comprising an OR gate for logically summing the logical pulse signals outputted from the first and second air bubble sensors, wherein the integrating section integrates pulse widths of the summed pulse signals during the time period.

38. The air bubble detector of claim 36, further comprising a switching section for selecting the first or second air bubble sensor and for receiving the logical pulse signals outputted from the selected air bubble sensor, wherein the integrating section integrates the pulse widths of the received logical pulse signals during the time period.

39. A sample analyzer comprising the air bubble detector of claim 36.

40. A sample analyzer comprising:

an adaptor for holding a sample container containing

a sample;

a rack for removably receiving the adaptor;

a preparing section for preparing an analysis sample from the sample; and

an analyzing section for analyzing the prepared analysis sample,

wherein the adaptor comprises a sample container supporting section for receiving the sample container and a receiving tray for receiving the sample to be spilled from the sample container.

41. The sample analyzer of claim 40, wherein the receiving tray is provided around an inlet of the sample container supporting section.

42. The sample analyzer of claim 40, further comprising:

an adaptor detecting sensor for sensing the adaptor to be received by the rack; and

a controller for controlling the preparing section corresponding to an output of the adaptor detecting sensor;

wherein the adaptor comprises a first identity section to be sensed by the adaptor detecting sensor.

43. The sample analyzer of claim 40, further comprising:

an adaptor recognizing sensor for recognizing a type of

the adaptor; and

a controller for controlling the preparing section corresponding to an output of the adaptor recognizing sensor;

wherein the adaptor comprises a second identity section to be sensed by the adaptor recognizing sensor.

44. The sample analyzer of claim 40, wherein the rack has a notch for positioning the adaptor, and the adaptor has a projection to be fitted into the notch.

45. The sample analyzer of claim 40, wherein the rack has a projection for positioning the adaptor, and the adaptor has a notch to be brought into engagement with the projection.

46. An adaptor which is removably inserted in a rack of a sample analyzer to hold a sample container containing a sample, comprising:

a sample container supporting section for receiving the sample container; and

a receiving tray for receiving the sample to be spilled from the sample container.

47. The adaptor of claim 46, wherein the receiving tray is provided around an inlet of the sample container supporting section.

48. The adaptor of claim 46, further comprising a first identity section to be sensed by an adaptor detecting sensor provided in the sample analyzer, the adaptor detecting sensor sensing whether the adaptor is inserted in the rack.

49. The adaptor of claim 46, further comprising a second identity section to be sensed by an adaptor recognizing sensor provided in the sample analyzer, the adaptor recognizing sensor recognizing a type of the adaptor.

50. The adaptor of claim 46, further comprising a positioning portion for positioning the adaptor with respect to the rack.

51. The adaptor of claim 46, wherein the sample container supporting section receives the sample container to support the sample container resiliently.

52. The adaptor of claim 46, wherein a first recess is provided in the sample container supporting section, the sample container supporting section comprising a first resilient member inserted into the first recess and a sample container inserting section fitted into the first recess and mounted on the first resilient member, the sample container

inserting section receiving the sample container therein.

53. The adaptor of claim 52, wherein a second recess for receiving the sample container is provided in the sample container inserting section, and the sample container inserting section comprises a second resilient member for positioning the sample container in the second recess.

54. A sample analyzer comprising:

a preparing section for preparing an analysis sample to be analyzed; and

an analyzing section for analyzing the prepared analysis sample,

wherein the preparing section comprises a syringe pump unit used for preparing the analysis sample,

the syringe pump unit including:

a first syringe pump having a first cylinder and a first piston to be inserted in the first cylinder;

a second syringe pump having a second cylinder and a second piston to be inserted in the second cylinder;

a connecting section provided between the first syringe pump and the second syringe pump for connecting the first piston and the second piston; and

a driving source for driving the first and second pistons through the connecting section.

55. The sample analyzer of claim 54, wherein the first and second pistons are arranged in line.

56. The sample analyzer of claim 54, wherein when the driving source drives the first and second pistons, the connecting section actuates so that one of the first and second pistons starts moving and the other starts moving late.

57. The sample analyzer of claim 54, wherein the connecting section comprises:

a first terminal attached to the first piston;

a second terminal attached to the second piston; and

an engaging member for engaging the first and second terminals,

wherein the engaging member is engaged with the first terminal so as to have a first clearance in a moving direction of the first piston and engaged with the second terminal so as to have a second clearance in a moving direction of the second piston, the first clearance being smaller than the second clearance.

58. The sample analyzer of claim 57, wherein each of the first and second terminals comprises a pair of flanges spaced apart in a moving direction of the corresponding piston.

59. A syringe pump unit comprising:

a first syringe pump including a first cylinder and a first piston to be inserted in the first cylinder;

a second syringe pump including a second cylinder and a second piston to be inserted in the second cylinder;

a connecting section for connecting the first piston and the second piston; and

a driving source for driving the first and second pistons through the connecting section.

60. The syringe pump unit of claim 59, wherein the first and second pistons are arranged in line.

61. The syringe pump unit of claim 59, wherein when the driving source drives the first and second pistons, the connecting section actuates so that one of the first and second pistons starts moving and the other starts moving late.

62. The sample analyzer of claim 54, wherein the connecting section comprises:

a first terminal attached to the first piston;

a second terminal attached to the second piston; and

an engaging member for engaging the first and second terminals;

wherein the engaging member is engaged with the first terminal so as to have a first clearance in a moving direction of the first piston and engaged with the second terminal so as to have a second clearance in a moving direction of the second piston, the first clearance being smaller than the second clearance.

63. The syringe pump unit of claim 62, wherein each of the first and second terminals comprises a pair of flanges spaced apart in a moving direction of the corresponding piston.

64. A sample analyzer comprising:

a preparing section for preparing an analysis sample to be analyzed using a sample, a first liquid and a second liquid; and

a detector for detecting a signal from the analysis sample,

wherein the preparing section comprises a liquid transfer unit,

the liquid transfer unit including:

a pump connected to a first liquid retaining section for storing the first liquid and a second liquid retaining section for storing the second liquid;

a flow path for connecting between the pump and the second liquid retaining section;

a third liquid retaining section placed in the flow path; and

a liquid discharge section connected to the third liquid retaining section;

the pump transporting the second liquid from the second liquid retaining section to the third liquid retaining section and discharging the second liquid with the first liquid via the liquid discharge section to the detector.

65. The sample analyzer of claim 64, wherein the third liquid retaining section is tubular.

66. The sample analyzer of claim 64, wherein the flow path comprises:

a first flow path provided between the second and third liquid retaining sections; and

a second flow path provided between the third liquid retaining section and the pump, and

wherein the liquid transfer unit further comprises:

a third flow path provided between the pump and the first liquid retaining section;

a forth flow path provided between the third liquid retaining section and the liquid discharge section; and

first, second, third and forth valves for opening and closing the first, second, third and forth flow paths,

respectively.

67. The sample analyzer of claim 64, wherein the liquid transfer unit comprises an air flow path for supplying air to the third liquid retaining section, the pump supplying the air to the third liquid retaining section through the air flow path before transporting the second liquid to the third liquid retaining section.

68. The sample analyzer of claim 64, wherein the first liquid is a diluent and the second liquid is a hemolyzing agent.

69. The sample analyzer of claim 64, further comprising:

a first valve for connecting and isolating the first liquid retaining section and the pump; and

a second valve for connecting and isolating the second liquid retaining section and the pump,

wherein the first valve is opened and the second valve is closed when the pump sucks the first liquid, and the second valve is opened and the first valve is closed when the pump sucks the second liquid.

70. A liquid transfer unit comprising:

a pump connected to a first liquid retaining section for storing a first liquid and a second liquid retaining section for

storing a second liquid;

a flow path for connecting between the pump and the second liquid retaining section;

a third liquid retaining section placed in the flow path; and

a liquid discharge section connected to the third liquid retaining section;

the pump transporting the second liquid from the second liquid retaining section to the third liquid retaining section and discharging the second liquid with the first liquid via the liquid discharge section.

71. The liquid transfer unit of claim 70, wherein the third liquid retaining section is tubular.

72. The liquid transfer unit of claim 70, wherein the flow path comprises:

a first flow path provided between the second and third liquid retaining sections; and

a second flow path provided between the third liquid retaining section and the pump;

the liquid transfer unit further comprising:

a third flow path provided between the pump and the first liquid retaining section;

a forth flow path provided between the third liquid

retaining section and the liquid discharge section; and

first, second, third and forth valves for opening and closing the first, second, third and forth flow paths, respectively.

73. The liquid transfer unit of claim 70, further comprising an air flow path for supplying air to the third liquid retaining section, the pump supplying the air to the third liquid retaining section through the air flow path before transporting the second liquid to the third liquid retaining section.

74. The liquid transfer unit of claim 70, wherein the first liquid is a diluent and the second liquid is a hemolyzing agent.

75. The liquid transfer unit of claim 70, further comprising:

a first valve for connecting and isolating the first liquid retaining section and the pump; and

a second valve for connecting and isolating the second liquid retaining section and the pump,

wherein the first valve is opened and the second valve is closed when the pump sucks the first liquid, and the second valve is opened and the first valve is closed when the pump sucks the second liquid.